



ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent 1000-D3 BYPASS RATIO: 9.0
 UNIQUE ID NUMBER: 19RR087 PRESSURE RATIO (π_{00}): 45.8
 COMBUSTOR: Phase5 Tiled
 ENGINE TYPE: TF RATED THRUST (F_{00}) (kN): 334.7

REGULATORY DATA **** DATA SUPERSEDED **** SEE FOLLOWING UID FOR REVISED DATA: **01P19RR108**

| CHARACTERISTIC VALUE: | HC | CO | NO _x | SMOKE NUMBER |
|--|-----|-----|-----------------|--------------|
| D _p /F ₀₀ (g/kN) or SN | 0.0 | 8.5 | 65.4 | 16.4 |
| AS % OF ORIGINAL LIMIT | 0.0 | 7.2 | 49.7 | 96.4 |
| AS % OF CAEP/2 LIMIT (NO _x) | | | 62.1 | |
| AS % OF CAEP/4 LIMIT (NO _x) | | | 66.3 | |
| AS % OF CAEP/6 LIMIT (NO _x) | | | 72.2 | |
| AS % OF CAEP/8 LIMIT (NO _x) | | | 80.0 | |

DATA STATUS

- PRE-REGULATION
 x CERTIFICATION
 - REVISED (SEE REMARKS)

TEST ENGINE STATUS

- NEWLY MANUFACTURED ENGINES
 x DEDICATED ENGINES TO PRODUCTION STANDARD
 - OTHER (SEE REMARKS)

EMISSIONS STATUS

x DATA CORRECTED TO REFERENCE
 (ANNEX 16 VOLUME II)

CURRENT ENGINE STATUS

(IN PRODUCTION, IN SERVICE UNLESS OTHERWISE NOTED)
 - OUT OF PRODUCTION (DATE: -)
 - OUT OF SERVICE (DATE: -)

MEASURED DATA

| MODE | POWER SETTING (%F ₀₀) | TIME (minutes) | FUEL FLOW (kg/s) | EMISSIONS INDICES (g/kg) | | | SMOKE NUMBER |
|--|-----------------------------------|----------------|------------------|--------------------------|------------|-----------------|--------------|
| | | | | HC | CO | NO _x | |
| TAKE-OFF | 100 | 0.7 | 2.497 | 0.00 | 0.41 | 52.07 | 8.4 |
| CLIMB OUT | 85 | 2.2 | 2.046 | 0.00 | 0.45 | 40.11 | 11.6 |
| APPROACH | 30 | 4.0 | 0.667 | 0.00 | 0.65 | 14.08 | 8.6 |
| IDLE | 7 | 26.0 | 0.249 | 0.00 | 6.23 | 6.16 | 1.9 |
| LTO TOTAL FUEL (kg) or EMISSIONS (g) | | | 924 | 0 | 2690 | 20943 | - |
| NUMBER OF ENGINES | | | | 5 | 5 | 5 | 6 |
| NUMBER OF TESTS | | | | 11 | 11 | 11 | 8 |
| AVERAGE D _p /F ₀₀ (g/kN) or AVERAGE SN (MAX) | | | | 0.0 | 8.0 | 62.6 | 15.3 |
| SIGMA (D _p /F ₀₀ in g/kN, or SN) | | | | 0.0 | 1.9 | 1.0 | 1.7 |
| RANGE (D _p /F ₀₀ in g/kN, or SN) | | | | 0.0 | 5.23-10.11 | 61.46-63.57 | 12.1-16.8 |

ACCESSORY LOADS

POWER EXTRACTION 0 (kW) AT - POWER SETTINGS
 STAGE BLEED 0 (% CORE FLOW) AT - POWER SETTINGS

ATMOSPHERIC CONDITIONS

| | |
|----------------------|-----------------|
| BAROMETER (kPa) | 98.9-102.1 |
| TEMPERATURE (K) | 275-304.6 |
| ABS HUMIDITY (kg/kg) | 0.00308-0.01935 |

FUEL

| | |
|----------|------|
| SPEC | |
| H/C | 1.91 |
| AROM (%) | 17.2 |

MANUFACTURER: Rolls-Royce plc
 TEST ORGANIZATION: Rolls-Royce
 TEST LOCATION: Derby
 TEST DATES: 24/09/2009-30/11/2017

NO_x REGULATION PARAGRAPH

| | |
|---|-------------------|
| | 2.3.2 c) (CAEP/4) |
| | 2.3.2 d) (CAEP/6) |
| x | 2.3.2 e) (CAEP/8) |

REMARKS

1. Data from Certification Report EDNS01000615769
2. Certification in accordance with Part III, Chapter 2, of Amendment 8 of ICAO Annex 16 Vol. II.
3. NO_x levels in accordance with Part III, Chapter 2, 2.3.2 e) (CAEP/8)

Compliance with Fuel Venting requirements: x ('x' if complies, 'PR' if pre-regulation, '-' if information is not available)